
# Vermont State Nuclear Advisory Panel
# Combined Annual Reports
# 2003 and 2004

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## SUMMARY

This document reports on Panel activities for the years 2003 and 2004. The Panel remained informed of the operating status of and issues surrounding the Vermont Yankee Nuclear Power Station, as well as other nuclear issues important to Vermonters. The Panel was supplied with correspondence and reports on important issues.

During this two-year period, the Panel=s major focus was Entergy=s request to increase Vermont Yankee=s power level by 20% - APower Uprate.@ While the Panel heard reports on other subjects, power uprate dominated the Panel=s attention at each of the meetings in this biennium.

The Panel considered the request for power uprate to be the most significant issue to come before it in many years, and the nine meetings in this biennium constitute the highest number in the Panel=s history. Public interest in power uprate is high and, different than the past, some meetings were attended by hundreds of people. At each meeting, the Panel provided opportunity for public comments.

The proposed power uprate has the ability to evoke strong views, and this biennium saw a heightened level of Panel discussion because some of the Members questioned the direction being taken regarding power uprate. A major issue concerned whether the benefits of uprate outweighed the risks - BOTH safety risks and economic risks.

During the period, the Public Service Board determined that Entergy demonstrated that the proposed uprate provided an economic benefit to Vermont provided that additional independent engineering investigation were to confirm that the uprate would not materially affect reliability and, hence, would not materially endanger the regular flow of electricity to Vermont at agreed prices. The Nuclear Regulatory Commission (NRC) is respon-sible to assure that the necessary margin of safety is achieved and does not directly consider reliability.

During the period, the proposed power uprate dominated the work priorities of the Department of Public Service (DPS) which chairs and staffs the Panel.

## INTRODUCTION

The Vermont State Nuclear Advisory Panel (V-SNAP) is established by and functions in accordance with Vermont Statutes Annotated (VSA), Title 18, Chapter 34. Its primary function is to consider issues related to the use of nuclear power in the State of Vermont. Issues for consideration include, but are not limited to, responsibilities of state agencies for assuring the safety and health of the public, changes in operation and problems associated with nuclear facilities, state-federal regulatory interface, and potential liabilities, benefits and repercussions of nuclear power generation in the state.

Membership of V-SNAP consists of 1) the secretary of the agency of human services, or designee, 2) the secretary of the agency of natural resources, or designee, 3) the commissioner of the department of public service, 4) a member of the Vermont house of representatives, 5) a member of the Vermont senate, and 6) two members of the public. In 2003 and 2004 V-SNAP representation consisted of:

- Commissioner David O=Brien, Chair
- Larry Becker, State Geologist, Designee for Secretary Elizabeth McLain
- Razelle Hoffman-Contois, Fran deFlorio, Larry Crist, and Carla White, Designees for Secretary Charles Smith
- Senator Mark MacDonald
- Representative Philip Bartlett
- Russell Kulas
- Timothy Nulty

Staff services were provided by the DPS: William Sherman, State Nuclear Engineer, and Brenda Pepin, Administrative Secretary.

This report is provided in accordance with 18 VSA '1701(1), which establishes that V-SNAP shall provide an annual written report to the Governor and to the energy committees of the General Assembly.

## MEETINGS

During 2003 and 2004, nine meetings were held to consider the issues identified:

| Date | Location | Subject/Presentation |
|---|---|---|
| March 19, 2003 | Montpelier | General Introduction for new Panel Members, Reports on the transition of ownership to Entergy, on the completed Fall 2002 Vermont Yankee refueling outage, and on the proposed 20% increase in power level (Apower uprate@). |
| June 11, 2003 | Vernon | Presentation by Nuclear Regulatory Commission (NRC) of the proposed power uprate |
| August 20, 2003 | Brattleboro | Presentation by New England Coalition and Nuclear Free Vermont on the proposed power uprate |
| October 2, 2003 | Vernon | Presentation by Vermont Emergency Management on evacuation plans for Vermont Yankee area. Presentation by Entergy on adoption of Alternate Source Terms |
| November 12, 2003 | Brattleboro | Presentation by Entergy of details of its power uprate application to NRC |
| December 17, 2003 | Vernon | **Scheduled but canceled due to weather.** A scheduled NRC presentation regarding power uprate was deferred to the next meeting. |
| March 31, 2004 | Vernon | Summary of power uprate and steam dryer issues prior to an NRC public meeting in the evening. |
| May 18, 2004 | Brattleboro | Summary of power uprate issues and description of missing fuel rod segments |
| July 29, 2004 | Vernon | Summary of power uprate and missing fuel issues and description of transformer fire |
| December 16, 2004 | Brattleboro | Special Meeting - NRC presentation on the independent engineering inspection at Vermont Yankee |

In addition to the major subject presentation, each meeting included a discussion of Vermont Yankee nuclear plant activities since the preceding meeting. Meetings were attended by representatives from Vermont Yankee Nuclear Power Corporation, public interest groups, members of the press and interested individuals. Various documents related to the subjects of the meetings and matters of interest to the Panel were provided during the year. Members of the public were invited at the end of each meeting to make comments to the Panel. These comments are summarized in the records for each meeting.

## MOTIONS AND RESOLUTIONS

At the meeting of June 11, 2003, the Panel passed the following motion:

Moved by Member Kulas, Seconded by Member Nulty, agreed on substitution by Member Macdonald:

1. That the Panel will consider and vote on the following item at its next meeting:

   The Panel requests the Department of Public Service to request that the Public Service Board not make its final decision on the uprate until after the NRC review is complete and the Department of Public Service and the Panel have a chance to review that report from the NRC; and

2. That the Panel create for itself a schedule of workshops and meetings, all to be public and hopefully in this area, over the course of now until the Department of Public Service makes its final presentation to the Public Service Board; that those meetings be on a schedule of approximately 4 to 6 week time period, and that our next meeting we will hammer out a schedule for those meetings, what topics will be dealt with, when the NRC steps can be brought in, such as the draft environmental report and the report of the Advisory Committee on Reactor Safeguards, and other NRC reports; and

3. That the Panel would have a preview of the Department of Public Service presentation to the Public Service Board, that is, its final presentation where it would deal with this risk/benefit equation.

At the meeting of March 31, 2004, the Panel unanimously passed the following resolution:

Moved by Chairman O'Brien, Seconded by Member Bartlett:

The Vermont State Nuclear Advisory Panel endorses the independent engineering assessment The PSB requested the following attributes from the requested by the Vermont Public Service Board in its March 15, 2004 letter to NRC Chairman Nils Diaz.

At the meeting of July 29, 2004, the Panel unanimously passed the following resolution:

Moved by Member MacDonald, Seconded by Member Nulty:

The Vermont State Nuclear Advisory Panel urges the state to request a hearing in the NRC power uprate review process to pursue answers to its questions in the safety area.

## VERMONT YANKEE POWER UPRATE

### Power Uprate - General Description

The major event of the period concerned consideration of the proposed extended power uprate (EPU) of Vermont Yankee of 20%. Entergy proposed to increase power in two steps - approximately half the amount upon NRC approval in January 2005, and the other half following the Fall 2005 refueling outage. This schedule has subsequently slipped as a result of continuing NRC review of steam dryer and other issues. At the time of this report, if NRC grants power uprate, it does not appear that will occur until 2006.

### Power Uprate - Public Service Board Review

Entergy applied to the Vermont Public Service Board (PSB) in February 2003 for a certificate of public good in accordance with 30 V.S.A. '248 for the proposed power uprate. The PSB's purview included economic and environmental aspects of the proposed power uprate. Starting with the August meeting, the DPS gave reports of the status of the PSB proceeding. The PSB granted a certificate of public good for the proposed power uprate on March 15, 2004, contingent on the results of an independent engineering assessment by the NRC.

NRC inspection:

- Independence – the assessment should be performed by inspectors who have not had recent involvement at Vermont Yankee
- Scope – a vertical slice of two safety systems and two non-safety systems with four inspectors working four weeks
- Basis – for verifying that Vermont Yankee will continue to operate reliably with power uprate
- ACRS Review – the results of the assessment will be provided to the ACRS as part of its review of Vermont Yankee power uprate

As a result of the PSB certificate of public good, Entergy completed the hardware modifications for power uprate in its Spring 2004 refueling outage. The overall cost of power uprate evaluations and modifications was in excess of $60 million.

**Power Uprate - Independent Engineering Assessment**

NRC responded on May 4, 2004 to the PSB that it would conduct an independent engineering assessment at Vermont Yankee and this was described at the May 2004 meeting. The letter stated that NRC regulations and its oversight process focus on ensuring nuclear safety. NRC's statutory authority does not extend to regulating the reliability of electrical generation. The NRC recognizes, however, that there is some overlap between attributes that result in safe operation and those that contribute to overall plant reliability. Thus the assessment would be directed toward nuclear safety rather than reliability as the PSB requested.

During the period from August 9 to September 3, 2004, a team of eight NRC inspectors conducted the independent engineering assessment. State Nuclear Engineer William Sherman participated in the inspection, representing the state. NRC provided the results of the inspection on December 2, 2004, and NRC provided these results to the Panel at a special meeting on December 16, 2004.

The inspection was the first of four pilot inspections across the U.S. being conducted by NRC. It involved about 900 hours of direct inspection. The inspection team focused on forty-five components and operator actions that represented high risk and had the lowest relative safety margins. NRC considers this an improvement over the vertical slice of four systems requested by the PSB. In addition, the inspection included specific items affected by power uprate.

The inspection found eight findings of very low risk significance (Green Findings). The findings did not result in system inoperability either for current or uprated power levels, and the findings were not indicative of programmatic breakdowns. Corrective actions for all the findings will be reviewed by NRC.

**Power Uprate - NRC Review**

In September 2003, Entergy submitted to the NRC an application to amend its operating license for an EPU of 20%. The NRC's purview is nuclear safety. This application material was presented to the Panel for review. Descriptions of the modifications proposed in the NRC application were provided to Panel at the November 2003 meeting.

On December 8, 2003, DPS asked questions of NRC regarding Entergy's consideration of the pressure buildup in the reactor containment ("containment overpressure") following an accident or transient event for demonstration of the adequacy of the pumps that provide cooling to the reactor fuel ("emergency core cooling system (ECCS) pumps"). The engineering parameter measured to determine this adequacy is called *net positive suction head* (NPSH). This DPS letter was provided and described to the panel at the May 2004 meeting. At that meeting, the NRC had not answered the letter.

The June 29, 2004 response by NRC was provided and discussed at the July 2004 meeting. Chairman O'Brien identified that NRC's response did not answer DPS's questions and that the Department was still pursuing the matter. At this same July meeting, the NRC notice of opportunity to request a hearing in the power uprate case was provided to the Panel. Subsequently, in August 2004, the Panel was informed that DPS requested an NRC hearing to resolve its concerns regarding containment overpressure. An Atomic Safety and Licensing Board (ASLB) was constituted. There were several rounds of comments provided to the Panel and the Panel was informed of

the ASLB prehearing conference in Brattleboro on October 21 and 22, 2004. The ASLB granted the DPS a hearing on the overpressure issue in its order of November 22, 2004[1]. The NRC-ASLB hearing process is ongoing at the time of this report.

NRC review of power uprate is also ongoing. Because of failure of the steam dryers at Quad Cities Nuclear Plant in Illinois as a result of power uprate, the NRC is devoting detailed attention to Vermont Yankee's steam dryers. Entergy described its modifications to the steam dryer to the Panel at the May 2004 meeting, and handouts from a presentation at NRC were provided to the Panel at the July 2004 meeting. NRC has announced that it will not meet its stated review schedule and is unable to establish a schedule for completion of the power uprate review because of continuing questions regarding the steam dryer analysis.

## MANAGEMENT OF SPENT NUCLEAR FUEL

At the March 2003 meeting, the Panel was informed that the proposed 20% power uprate would result in approximately 20% additional spent fuel. Entergy stated at this meeting that it was considering construction of a dry fuel storage area which would allow spent fuel to be taken out of the spent fuel pool and packaged in metal/concrete containers in preparation to ship to the proposed federal facility at Yucca Mountain, NV. The type of storage container Entergy is considering has been approved by the NRC and is already in use at many plants around the country. Dry fuel storage containers do not require any pumps, motors, water, electricity, or other support systems to safely store the fuel. The containers are designed for shipping by truck or rail to Yucca Mountain or other federal approved facility. Entergy has found a location for the containers inside the Vermont Yankee fenced-in security boundaries of the plant. The area will be protected and under constant surveillance.

Chairman O'Brien asked Entergy to describe the schedule needs for dry cask storage. It was stated that current spent fuel pool capacity runs out in Fall 2008. By going to power uprate, the capacity would run out in Spring 2007 and Vermont Yankee would need dry cask storage at that time. Entergy then clarified that after 2007, Vermont Yankee would not be able to do an offload of the full core, but that is not typically necessary. Member Kulas asked if Vermont Yankee always had to have capacity to offload the whole core. Entergy replied that it is not an NRC requirement to have full-core offload capability, but Vermont Yankee to date has felt it makes good business sense to have it.

## SOUTHEASTERN VERMONT EVACUATION PLANS

At the October 2003 meeting, members of Vermont Emergency Management reported on the Vermont Radiological Emergency Response Plans. The plans include an overall state plan, individual state agency procedures, town plans and plans for hospitals, nursing homes, campgrounds and parks, and public and private schools and day cares. The four emergency classification levels were identified: Unusual event, alert, site area emergency and general emergency. At the alert level or higher, state and local emergency facilities are activated. Possible protective actions include sheltering animals with stored feed and water, shelter people in place, close recreation areas and schools, recommend the ingestion of potassium iodide, and evacuation. Evacuation planning issues include identification of sufficient buses, vans and ambulances, provision for drivers, evacuation routes and timing. The emergency plan relies on buses from both Vermont and New Hampshire for emergency transportation.

Emergency management continues to work in the areas of developing and demonstrating the ability for evacuation in case of a radiological accident. Entergy has hired a contractor to perform a new evacuation study for the area. Mr. Sherman asked why Emergency Management did not contract itself with an

[1] The New England Coalition (NEC) also requested and was granted a hearing on two issues: large transient testing and the structural integrity of cooling towers.

evacuation contractor instead of relying on an Entergy contractor. Emergency Management stated they are limited in their funding.

## ADOPTION OF ALTERNATE SOURCE TERM

At the October 2003, the Panel heard a report on Entergy's license amendment to adopt the alternate source term. The term, *source term*, refers to the basis for determining radioactive releases as a result of accidents and transients. As a result of measurements after the Three Mile Island accident in 1979, it was realized that the source terms used for nuclear plant licensing were highly conservative.

For twenty years, the industry and the NRC conducted research and evaluation in this area, and in late 1999, the NRC adopted 10 C.F.R. §50.67 that allowed nuclear plants to used alternate source terms. Regulatory Guide 1.183 described the requirements. The results of using alternate sources terms are lower estimated radioactivity doses for accidents and transients. Entergy needed to adopt the alternate source term in order to meet radioactivity dose limits for power uprate.

DPS provided questions about alternate source terms to NRC in letters of September 8, 2003 and June 9, 2004. The NRC granted the license amendment in March 2005.

## MISSING SPENT FUEL SEGMENTS

Missing fuel segments at Vermont Yankee were discussed at the May 2004 meeting. As a result of questioning by NRC to specifically look at pieces put into a container in 1979, Entergy determined during the Spring 2004 outage that the fuel segments were not in the expected container. As a result, a team of twenty people were mobilized from Vermont Yankee and the Entergy fleet. By the May 2004 meeting, the inspection team had completed an inspection of 100% of the spent fuel pool with hand held and robotic cameras. The whole floor surface had been reviewed and the segments had not been found. All fuel pins that had been moved within assemblies had been verified to be in the assemblies of record. A 100% verification of the fuel pool, by serial number verification, had been completed.

It was felt there was a possibility that the segments had been shipped as low-level waste. Some low-level waste is more highly radioactive that the fuel segments.

The investigation team continued by reviewing 24 years of records to see if the location had changed and if the segments had been shipped to another site. At the July 2004 meeting, Entergy identified that in an interview with a past employee a small aluminum cannister was described. Also, as part of records reviewed from a vendor in California, a drawing of this small cannister was found. Upon re-review of fuel pool tapes, the cannister, which looked like part of a refueling machine, was located in the pool. When opened on July 13, 2004, the missing fuel segments were found. The segments had been in the pool the whole time.

## ISO-PHASE BUS FAILURE AND RESULTING FIRE

At the July 2004 meeting, the Panel heard a report on the transformer fire of June 18, 2004, which resulted in an automatic shutdown and an 18-day forced outage.

A portion of the electrical connection between the station's generator and the main transformer, call the "iso-phase bus," broke loose and grounded out the main electrical connections from the plant's generator to the main transformer. This short circuit prompted a surge arrester to fail and set fire to an cooling oil line at the top of the transformer. An unusual event, the first level of emergency, was declared at 0650 due to the fact that the fire was not extinguished within 10 minutes. The unusual event was exited at 1245 once the fire was extinguished and site personnel were certain that no fire reflash was possible. The plant performed an emergency shutdown.

The electrical connections to generator to the

transformer ( the isolated phase bus) were destroyed by the short circuit.

The failed iso-phase bus was examined. The fans cooling the bus had been replaced with more powerful fans. It was determined that the iso-phase bus in service was not able to withstand the higher air velocity, more than double by the power uprate requirements.

The iso-phase bus and transformer were repaired and the plant returned to service on July 6, 2004.

## OTHER VERMONT YANKEE ACTIVITIES AND EVENTS

**Spring 2004 Refueling Outage** - At the meeting of May 18, 2004, Entergy reported on its Spring 2004 refueling outage. The outage was completed on May 4, 2004, lasting 30.5 days.

The major work items were refueling of the reactor, conducting the regular testing required during outages, and accomplishing modifications for power uprate. These modifications included new feedwater heaters, a new high pressure turbine, new digital control systems, a new safety valve, steam dryer strengthening, main generator rewind, and new switchyard equipment.

## PANEL VIEWS AND COMMENTS

This section provides a summary and sampling of comments by Panel members. Public comments, often extensive, were taken at each meeting. In general public comment split between those who oppose the nuclear plant=s actions and those who support the actions. Individuals associated with the Southern Vermont business community seemed to favor plant actions. Those who associated themselves with groups traditionally opposed to nuclear power seemed to oppose plant actions.

Panel members commented freely on all the issues presented to the Panel. However, accounting for the great interest in the power uprate proposal during 2003 and 2004, the major comments regarding power uprate are summarized below:

**March 2003 Meeting**

Power uprate was introduced to the Panel at this meeting. Members Becker and Kulas asked how power could be increased by 20%. Entergy representatives attempted to explain, but the Panel was not fully satisfied by the explanation. Entergy stated it had not completed all the analyses associated with the uprate, but would do so for the NRC application scheduled for the Fall. Member Contois-Hoffman asked if additional radiation would be released from the plant and Entergy responded it would increase by approximately 20%.

Member MacDonald stated an analogy of running a wood furnace for more heat and running a hot rod on higher octane fuel. Member Kulas referred to the analogy as exactly the question that comes to mind. He expressed his view that the general atmosphere of those outside the company should be one of serious skepticism. He said the people in the state of Vermont should look at power uprate very carefully. Chairman O=Brien echoed that it was important through review, analysis and additional information, that a comfort level be reached regarding power uprate.

**June 2003 Meeting**

The meeting opened with a lengthy and informative presentation by NRC staff members on power uprate. Member Nulty asked whether NRC review of the uprate was focused on safety. This was affirmed. Nulty then asked whether the NRC used a “pass/fail” methodology—i.e. the NRC would not declare the uprate to be “unsafe” if it found ANY increased risk at all…rather, that the increased risk would have to be sufficiently great to breach a pre-determined threshold of “unacceptably great increased risk”. After some discussion of the complexity of the NRC’s safety standards, the NRC staff confirmed Nulty’s characterization. Member Nulty than asked whether the NRC could find some, “non-zero” increase in the degree of risk caused by the uprate and yet, if it did not breach the threshold, still determine that the uprate was “safe”. NRC staff agreed that this was possible. Nulty than asked whether, in the view of the NRC

staff, if the uprate increased risk by a non-zero amount but did not breach the threshold, would Vermont be justified in seeking compensation for this risk? The NRC staff conceded that, in principle, that might be so, but that this issue lay outside their institutional jurisdiction.

Following the above discussion, Member Kulas proposed an unannounced resolution for the Panel.

In making the motion, Member Kulas stated he wanted the Public Service Board process to balance economics with safety considerations in making its determination regarding power uprate, and that the Panel play a role in that decision making process. Member Nulty stated he too wanted to see this balancing of safety and economics. In discussion there was confusion regarding the effects of the motion. Chairman O=Brien stated he could not support the motion without further review. The resolution was modified slightly and passed, as identified earlier in this report.

**August 2003 Meeting**

The New England Coalition (NEC) and Nuclear Free Vermont were provided an opportunity to address the Panel on power uprate. Chairman O=Brien stated that, as a result of the resolution passed at the previous meeting, the Department would present a report at each meeting of the status of its review and its positions. In addition, testimony in the uprate case would be sent to the Panel.

Mr. Sherman described the PSB process. The PSB evaluates certificate of public good petitions according to the ten criteria in 30 V.S.A. '248 (b), and the PSB is preempted from considering nuclear safety which is in the purview of the NRC. Mr. Sherman stated the Department=s position was that Entergy had not demonstrated an adequate amount of benefits to the state for the power uprate. Member Nulty asked if that meant the Department was recommending the uprate not be approved, and Mr. Sherman responded it did.

Mr. Shadis of NEC identified its recommendation that PSB call for NRC to perform an Independent Safety Assessment (ISA) at Vermont Yankee. He described an ISA as comprising 25 members and inspecting thousands of hours onsite, as occurred at the Maine Yankee plant. Mr. Sherman stated that he did not believe an inspection of the magnitude of the Maine Yankee ISA was appropriate for Vermont Yankee.

Mr. Kulas expressed an interest in determining what type of independent assessment should be done, if not the Maine Yankee type. Member MacDonald was inclined toward asking for an independent review to verify for the public and the Panel the claims Entergy has made about power uprate.

There was considerable discussion regarding the resolution from the previous meeting. Chairman O=Brien stated that the Panel would meet more frequently on the power uprate issue (Motion, item 2). He stated his legal staff took exception with sharing Department positions before filing testimony, but that the Panel would be briefed on the Department=s positions at each meeting (Motion, item 3). Much discussion centered on whether the Panel should recommend that the Department request the Board to delay consideration until after NRC review was complete (Motion, item 1). Chairman O=Brien indicated he could not support the recommendation because the PSB and NRC processes were separate and did not need to be mixed. Member Kulas continued to believe the PSB should balance safety and economic issues. Mr. Sherman stated that the main focus of the Panel is intended to be safety. The Department intended to be active in the NRC review of safety items and he urged the Panel to come up with questions regarding uprate to forward to NRC as part of their review. In the end, the Panel withdrew item 1 of the previous meeting=s motion.

**October 2003 Meeting**

At the request of the Panel at the previous meeting, the Department had provided a memorandum regarding an Independent Safety Assessment. There was no further discussion of ISA at this meeting. Mr. Sherman described the Department=s rebuttal testimony that had been filed with the PSB the previous week. The Department continued not to support the proposed uprate because Entergy had not demonstrated sufficient benefit to meet the Board=s criteria.

Also, Entergy=s license amendment application for power uprate had been filed with the NRC since the last meeting and had been provided for review to the Panel. It was agreed that future presentations would concentrate on the application to NRC.

**November 2003 Meeting**

Mr. Sherman described the Department=s recently revised testimony in the PSB case on power uprate. Since Entergy had agreed to provide the state approximately $20 million in state benefits, the Department now found the proposal met the requirements for a certificate of public good. He stated that, even though we see the application meets the PSB requirements in economic areas, we continue to monitor the NRC review for safety requirements.

Member Kulas questioned why the majority of the funds were designated for a program to clean up state waterways instead of being returned to ratepayers. Chairman O=Brien responded that the PSB criteria only required a benefit to the state, and the waterway cleanup met that requirement. However, he suggested that the Panel could make other suggestions on how the benefit should be used. He stated the waterway cleanup proposal was only between Entergy and the Department, and the PSB would ultimately decide.

Member Nulty wished to clarify the point that the Panel was not bound to take the same positions as the DPS, but was free to take independent position. Chairman O=Brien agreed, with the caveat that the DPS has special expertise and the Panel should give weight to the DPS actions and expertise. Member Nulty reiterated that the Panel was independent.

Member Kulas made comments insinuating the Department made agreements Ain the closet,@ Subverting the PSB process. Chairman O'Brien responded that the Department's actions were consistent with its actions in all its PSB cases fulfilling its statutory responsibility. Settlement discussions occur frequently and are not made public in order that settlements can proceed productively.

Mr. Sherman reported on a Vermont Yankee uprate meeting at NRC headquarters. He indicated 1) that a numbers of reviewers stated there was not enough information provided and 2) that NRC reviewers appeared to be aggressive in their review of the application. Mr. Sherman also reported on operational history at other plants that have been approved for power uprate. Specifically he described the steam dryer failure at the Quad Cities plants in Illinois.

The majority of the meeting concerned description of Vermont Yankee modifications for the uprate, with special emphasis on steam dryer modifications.

Member Kulas asked if the ISA could be considered at the next meeting and Member Nulty asked that NRC representatives familiar with the Maine Yankee ISA be asked to testify regarding the ISA. (This subject was planned for a December 2003 meeting which was cancelled due to weather.)

**March 2004 meeting**

This meeting was a Panel meeting in advance of an evening NRC public meeting at the Vernon Elementary School. NRC would entertain Panel member questions among those from the public at the meeting.

Mr. Sherman described the PSB=s decision in the power uprate case. The PSB agreed to allow Entergy to make power uprate modifications at the plant, but withheld final approval pending an independent engineering assessment. PSB requested the NRC perform an independent engineering assessment consisting of four systems, requiring approximately four inspectors inspecting for four weeks. The independent engineering assessment was not an ISA, as described by Mr. Shadis in previous meetings, but was the proposal of NEC witness David Lochbaum before the PSB. PSB did not approve the proposed use of the benefit funds discussed in the previous meeting, but rather required the benefit to go to the general fund for appropriation by the general assembly.

Entergy reported that NRC notified them on December 15, 2003, that Entergy=s application was not complete enough to begin the NRC review. The problem was corrected and the NRC review, expected to take one year, began on January 31, 2004.

Chairman O=Brien moved that the Panel endorse the PSB=s request for an independent engineering assessment, and Member Bartlett seconded. Member Nulty called attention to the purpose of the PSB request: operational reliability and its effect on the economic effects of the uprate on Vermont, and queried whether the independent engineering assessment would address this. Member MacDonald suggested endorsing a broader recommendation that had passed the Vermont Senate. This proposal would have included a review of Entergy designed to show it met all present day regulatory requirements. Chairman O=Brien stated he could not support the Senate recommendation but that he could support the PSB=s determination because it was the result of a deliberative process with sworn testimony of expert witnesses. The motion passed unanimously. Member Kulas expressed appreciation for the action the Panel had taken.

**May 2004 Meeting**

Chairman O=Brien described the Department=s December 8, 2003 letter which requested information about Entergy=s use of containment overpressure for demonstrating the adequacy of ECCS pumps. The NRC had not responded to the letter as of this date.

Mr. Sherman spoke about the NRC=s proposed independent engineering assessment in response to the PSB request. The inspection will use risk assessment techniques and will consist of three weeks of onsite inspection by six or more independent inspectors.

Entergy described the modifications that were completed in the Spring 2004 outage, including inspection, repairs and modifications of the steam dryer. Cracks were found in the dryer. Member Kulas stated that GE should have done finite element analysis on the dryers, and Entergy agreed that fact was now clear. Member Crist asked about reinspection and Entergy stated that the dryers would be reinspected at every outage until it was established that cracks were not growing.

**July 2004 Meeting**

Chairman O'Brien described the NRC staff's response to the Department's questions of December 8, 2003, on containment overpressure credit. He said the Department is not satisfied with the answers in the letter and has additional questions. He also described the NRC notice of hearing related to the power uprate application. The notice has an August 30, 2004, deadline for responses. Chairman O'Brien stated he was interested in Panel input regarding the safety issues and the hearing. He stated that uprate represented unknowns in the safety area that required investigation.

Member MacDonald moved that the Panel urge the state to pursue a hearing in the NRC process. Members Contois-Hoffman and Becker signaled agreement and Member Nulty seconded. The resolution passed unanimously.

Entergy presented information about a transformer fire that resulted in a 18-day forced outage. Mr. Sherman asked Entergy to describe the new cooling unit added for power uprate which doubled the airflow in the electrical area that caused the fire. Member MacDonald asked about the impact and Chairman O=Brien described the ratepayer protection provisions for uprate related outages and the process for making the determination. The Department is pursuing the issue with Entergy and the Vermont utilities.

NEC testified that they were not satisfied by the independent engineering assessment planned by the NRC. Regarding a hearing, NEC stated they intended to ask for a hearing but the NRC process was very difficult and there was no assurance they would be successful. Regarding the state requesting a hearing, they warned that Vermont may be coming in with too little too late.

Commissioner O=Brien asked what was the point of the NRC assessment if NEC already knew it wouldn=t accept the results beforehand. NEC said it felt the plant was dangerous and they would like to shut it down. If not, they would like an independent assessment to make it as safe as possible.

Members MacDonald and Nulty recommended asking NRC to delay the hearing deadline based on the results of the independent engineering assessment.

**December 2004 Special Meeting**

Subsequent to this meeting, the state requested a delay in the hearing request deadline until the completion of the independent engineering assessment. The state was denied. In August 2004, both the state and NEC requested a hearing in the NRC process for power uprate. An Atomic Safety and Licensing Board (ASLB) was constituted. There were several rounds of comments provided to the Panel and the Panel was informed of the ASLB prehearing conference in Brattleboro on October 21 and 22, 2004. The ASLB granted the DPS a hearing on the overpressure issue in its order of November 22, 2004. NEC was granted a hearing on two items, large transient testing and structural analysis of cooling towers. The NRC-ASLB hearing is ongoing at the time of this report.

During the period from August 9 to September 3, 2004, a team of eight NRC inspectors conducted the independent engineering assessment. Mr. Sherman participated in the inspection, representing the state. NRC provided the results of the inspection on December 2, 2004, and NRC presented these results to the Panel at this special meeting. In the course of this presentation in response to Member Kulas's comments, NRC reaffirmed its statements in the May 4, 2004 letter to the PSB (which was discussed at the May 2004 Panel meeting). NRC does safety reviews and does not directly evaluate reliability for power generation. But reliability and safety go hand in hand. Safety systems NRC inspects are also important from the reliability aspect. The results of the inspection have been summarized earlier in this report.

Member Nulty questioned an NRC statement to the effect that finding eight items by this inspection does not mean there are hundreds of other items still undiscovered. NRC stated that there are probably other items to be found - inspections find items of very low significance frequently. However, the items selected were selected by a risk rating method and represented the most important areas in the plant.

Member Kulas expressed disappointment that the NRC presentation was not detailed enough, going through each component of the inspection and describing each finding in detail. NRC stated that it was prepared to present a more detailed presentation, but had deferred in order to meet what it thought was the Panel's wish - to leave as much time for questions as possible. For this reason, it had assured that copies of the inspection report were provided well before the meeting. The more detailed presentation would mean less time for public questions and comments. Member Kulas asked that the NRC make the more detailed presentation. Therefore, the NRC spoke in more detail.

Following the NRC detailed presentation, Member MacDonald stated that different groups had different definitions of what constitutes an "independent inspection." He asked who gets to decide. NRC responded that they performed the independent engineering inspection at Vermont Yankee to be responsive to the request of the PSB.

Member Kulas asked about the ACRS review of the independent engineering assessment which was part of the PSB's request. NRC responded that ACRS would review the results of the independent engineering inspection.

Member Nulty referred to his previous question. He asked if 45 items for the inspection were enough and how do we know they were the right items. NRC responded that different people would choose different components, but NRC feels any informed person would say the sample was a reasonable representative sample. Member Nulty pondered whether other experts would come to that agreement and whether the Panel should ask other experts.

Mr. Sherman spoke as the person designated by the state to observe the inspection. He specifically observed the risk process by which components were selected, and as one expert, agreed with NRC that it was a reasonable sample. Mr.Shadis of NEC in later comments also confirmed that, after talking with a number of experts, the method of determining components was not a bad way to do it. He did, however, believe that since eight findings were discovered in this inspection, it does indicate that more items would be discovered by more inspection.

**Summary**

As of the date of this report, NRC continues to review

the Entergy=s power uprate application for Vermont Yankee. A detailed review and continuing requests for additional information of the steam dryer issue have resulted in NRC=s inability to set a schedule for completion of the power uprate review.

The ASLB is awaiting NRC=s completion of its review prior to taking action on Vermont=s and NEC=s issues in the hearing process. They are requiring monthly schedule updates from the NRC staff.

The PSB continues to hold the power uprate docket open pending ACRS=s review of the independent engineering inspection.